

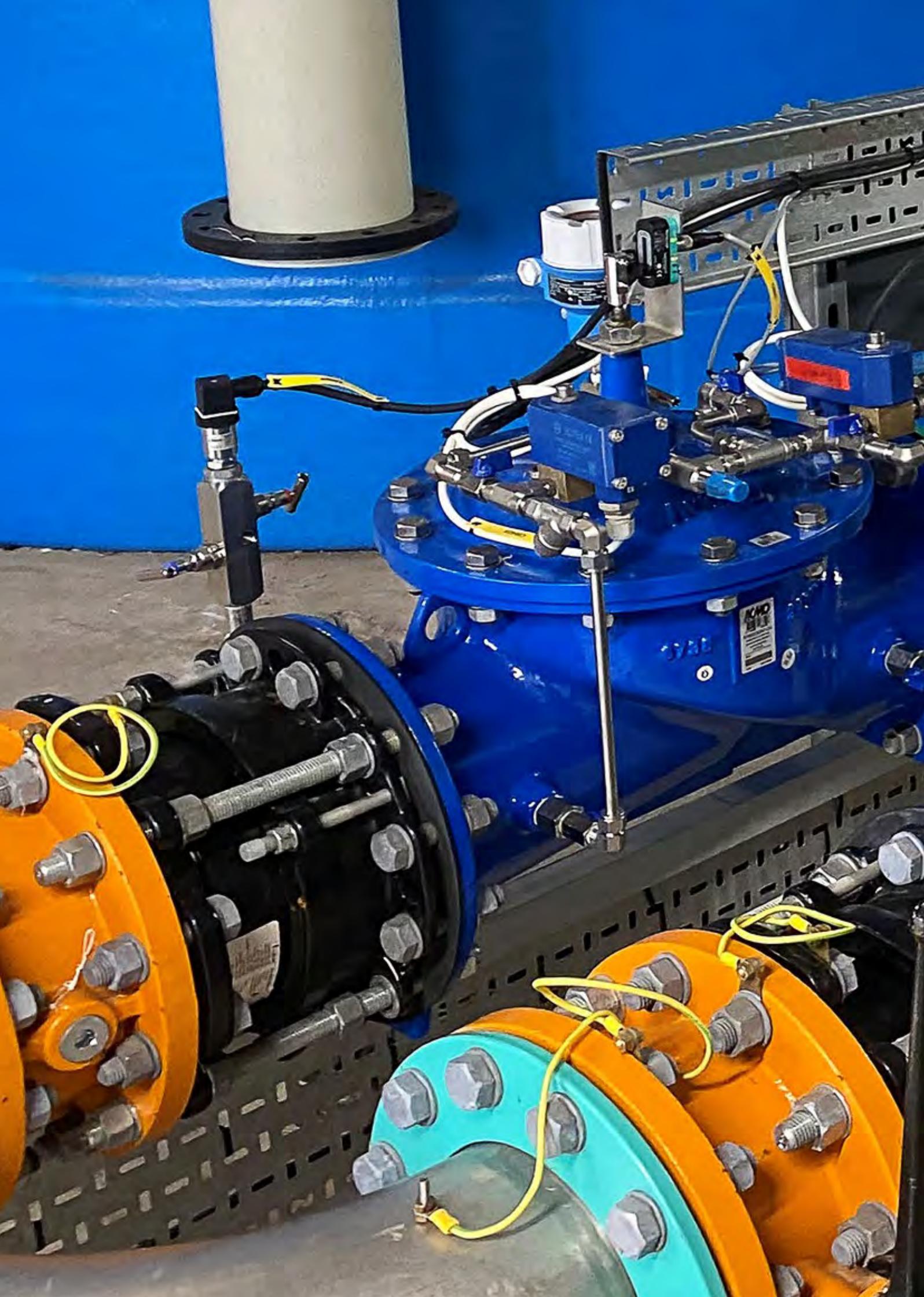
AVK SERIES 879 DIAPHRAGM CONTROL VALVE SOLUTIONS

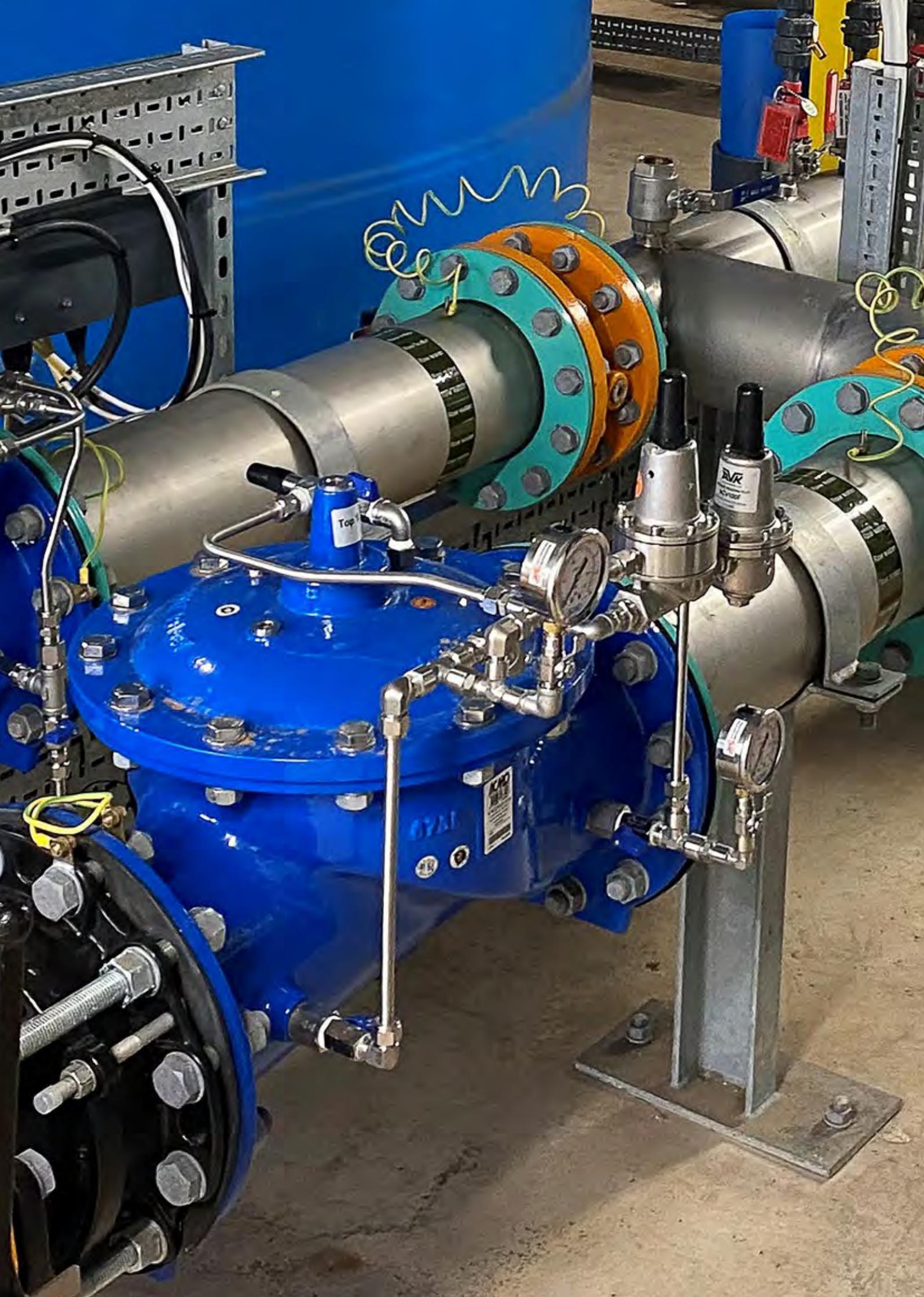


**AVK SERIES 879
DIAPHRAGM
CONTROL VALVE
SOLUTIONS**

Expect... **AVR**







WELCOME TO OUR SERIES 879 DIAPHRAGM CONTROL VALVE SOLUTIONS GUIDE



IN THE UK



Leading valve & fittings manufacturer for the Water, Wastewater, Gas & Firefighting industries. Expect... Quality.

www.avkuk.co.uk



Boundary boxes for water meters, water fittings and valves for a range of service pipes.

www.atplas.co.uk



International leader in the design, manufacture and distribution of electrofusion fittings, PE ball valves and associated products and services.

www.fusiongroup.com



Survey, design, refurbishment, installation as well as commissioning and asset maintenance and management.

www.glenfieldinvicta.co.uk

This document is designed to help engineers and installation teams learn more about AVK and its diverse range of innovative, resilient and technically supported products, which are manufactured to the highest quality to keep your pipeline networks safe, secure and leak free.

AVK UK is part of the globally renowned AVK Group who are based in over 100 countries and have over 4,500 employees worldwide.

To learn more, visit www.avkuk.co.uk

Additional Information

Our service offers

We offer Water & Wastewater engineered solutions, emergency repair clamp service's and a 24 hour emergency line, as shown below.

Emergency Repair Clamp Service

We offer a 24/7 emergency same day leak repair clamp service for water mains.

From our facility at Hyde, we offer either a same day, next day, 2 to 3 day service or a delivery to suit your requirement.

24/7 EMERGENCY REPAIR FITTING SERVICE 0800 202 8282

Water & Wastewater Engineered Solutions

Within our extensive scale of capabilities we can provide a comprehensive range of engineering and site solution packages. Our specialist teams come to you to identify the best solution - from feasibility and site audit to network leakage management and repair.

Engineered Solutions

enquiries@glenfieldinvicta.co.uk
+44 (0) 1563 521150

Pressure Management

Automatic control valves are used to obtain efficient flow management and pressure resulting in reduced:

- Water loss through leakages.
- Risk of water hammer and pipe bursts.
- Disruption to consumers.
- Minimized risk of contamination.
- Increased savings for water companies.

Pressure Reducing Control Valves

A pressure reducing control valve will automatically reduce a higher inlet pressure to a lower outlet pressure - regardless of changes in flow rate or inlet pressure.

Pressure sustaining/relief control valve

A pressure sustaining control valve automatically maintains a minimum pre-set inlet pressure by relieving excess pressure regardless of changes in flow rate.

CONTENTS

PAGE

06 Case Study: AVK Smart Water. A Two-Fold Solution in One

08 AVK UK Facilities and Capabilities

09 Outstanding Features

10 Series 879 Variants

12 Product Selection

13 Reduce or Sustain

14 Diaphragm Operated: The Benefits

15 Product Specification

16 Series 879 Pilot System

18 Optimised Operation

19 Main Valve Series 879

20 Technical Detail

22 Material of Construction

23 Series 879 Control Valve Specification

24 Control Valve Videos

25 Associated Products

26 AVK Assist

27 Expect... Our Promises To You

CASE STUDY: AVK SMART WATER SYSTEM SOLVES CHALLENGE AT MAJOR ENGINEERING SITE

AVK Diaphragm Control Valves fitted with VIDi flow and pressure sensors send alerts to the Operations Team.

Located between Redcar and Middlesbrough, the Wilton Science Park houses companies that work at the cutting edge of the life sciences, sustainable processing and manufacturing technology.

The Challenge

In 2019, a burst water main feeding the Park caused damage running into the hundreds of thousands of pounds. The resulting insurance investigations led to the Wilton Science Park's insurers insisting that a contingency shut-off valve be installed as part of the reinstatement works. A complicating factor, however, was that the Park's fire main was also fed by the same water supply and could not be compromised.

Control Valve and Sensors Product Selection

The chosen solution was to fit an AVK Series 879 diaphragm control valve fitted with VIDi flow and pressure sensors. The valve and sensors were, in turn, linked to an AVK UK Smart Water PMD (Pressure Management Device). The valve, sensors and PMD were located in an above-ground housing for ease of access and maintenance.

Instant Flow and Pressure Level Alerts

The PMD and VIDi sensors send alerts to the Wilton Science Park's operations team when flow and pressure levels breach agreed levels. If there is a leak, the PMD can reduce pressure and alert the operations team who are able to close off the flow from their mobile phones or laptops. This is all achieved via remote communications to the valve. If changes in flow and pressure are due to a fire, the valve remains open.

Leak Detection

The new arrangement has already shown its worth in normal working conditions. The VIDi sensor detected a change in flow indicating a possible leak on the network. The PMD reduced pressure which saved a significant amount of water whilst the leak was detected and remedial measures taken.

The images on the right show the before, during and after with the valve, sensors and PMD located in an above-ground housing for ease of access and maintenance with the engineering drawings overlaid. The large image on page 7 shows the AVK Series 879 diaphragm control valve fitted with VIDi flow and pressure sensors.

Training and Support

AVK UK Smart Water Specialist Team were responsible for the planning, specification and commissioning of the new valve configuration. Additionally Specialist Smart Water Team also delivered training to the Wilton Science Park's operations team to ensure they were able to get the most from the PMD and VIDi sensor technology.

Training on all of AVK's Smart Water products and applications is available on up request.

Simply call or email AVK UK on:

T: +44 (0) 1604 601188

E: customerservice@avkuk.co.uk





ACMD AVR
Pressure Management Device

IP65



AVK UK FACILITIES AND CAPABILITIES



AVK UK's Control Valve assembly and testing facility is based in Kilmarnock, Scotland, the site fulfills the demand for all AVK UK & Ireland Control Valve framework agreements. In addition, the site houses a dedicated, free of charge, training and demonstration hub for customers.

With local technical expertise and on-site service teams, AVK UK offers its customers product identification, diagnostics, selection and application advice, product training and operating & maintenance guidance.

All AVK customer facing employees hold the relevant Site Safety Passport and where necessary confined space and other relevant certification.

Leakage and water sustainability

High levels of water that has been produced but "lost" before it reaches the customer through leaks, theft or metering inaccuracies is a source of unwanted cost to the water utilities.

From a public health and drinking water quality perspective, water losses need to be minimised in order to avoid the risk of drinking water contamination in the distribution network. When supplying potable water to populated areas, the water quality required must meet high standards.

These standards also apply to the equipment being used to deliver the water such as pipes, pumps, isolation valves, automatic control valves and filtration systems. Installation of a potable water system is an investment and requires a full understanding of the dynamics within the system.

How a diaphragm control valve can help

Automatic control valves such as pressure reducing, pressure sustaining, constant flow and pressure relief, control and optimise the systems performance. These can be used to provide optimum pressure and flow conditions for a system, resulting in:-

- **Less** leakage
- **Less** wastage
- **Less** impact on the environment
- **Less** disruption to consumers
- **Improved** financial savings to water companies

Reducing leakage, improving sustainability: the benefits

Financial gains from increased efficiency in water distribution are:-

- Facilitates early leak detection before they become a major problem.
- Water systems work effectively when water pressure is stabilised and remains constant.
- Increased capability due to increased pressure, improving transmission.
- Reduced property damage caused by water leakage.
- Better understanding of what is happening to the water after it leaves the treatment plant.
- Reduced risk of water contamination.
- Fluctuating water pressure usually denotes a problem in the water system, which affects the systems performance.
- Early detection will identify potential problems allowing the opportunity to carry out repairs, which will significantly reduce overall costs and disruptions.

Within AVK UK group, below are some of the accreditations that we proudly hold:



OUTSTANDING FEATURES



Quality management

AVK UK's quality control system certified to ISO 9001, complies with the procedures documented in all of AVK UK's quality manuals. All products are inspected and tested to existing standards before leaving AVK UK's factory. AVK UK is dedicated to making quality guidelines an integrated part of AVK UK's production processes.

Production

AVK is well known for the production of valves, which incorporate high design standards with a reputation for reliability and long trouble free operation. This reputation has been earned through extensive experience in supplying products that exceed customers expectations. This philosophy follows through into our after sales service support, where a fast, efficient and professional response is a key success factor.

The expansion and success of AVK depends on brand recognition and quality. Only by listening to our customers will we be able to continue living up to the market expectations of today and tomorrow.

Pilot system:

- **Stainless steel pilot:** standard spring range for a PRV will be 1-5bar however this is easily interchangeable with lower or higher pressure ranged springs.
- **Functionality:** The automatic control valve can easily be altered to suit different functions with an additional option of replacing the control pilot (original valve can be used).
- **External Fittings:** AISI 316 stainless steel as standard for all fittings.
- **Filter System:** Inline high capacity filter which can be easily cleaned. The procedure can be carried out while the valve is in operation, no need to close down the system. Optional extra: Flushing Discharge Valve.
- **Regulator Control Unit:** Easy adjustment capable of precise settings using the ergonomic design, modules can easily be changed with minor alteration.
- The AVK Series 879 control valve is designed and tested to be **compatible** with all third party PRV controllers.

Main valve:

- Lifted seat to avoid damage due to cavitation. High Kv valve at fully open position. All non coated internals made of AISI 316.
- Fusion bonded epoxy coated ductile iron body and bonnet.
- EPDM nylon reinforced diaphragm, positioned to give less stress near closed position, easy access to replace diaphragm.
- New parabolic plug design provides high ratio of travel allowing and improving a smooth control performance, reducing noise and vibration.
- V-port plug: increases stability of control at very low flow conditions.
- **Anti Cavitation Trim:** Reduces noise and improves the life span of the valve by avoiding erosion. Optional extra in AISI 316 Stainless Steel.
- **Speed Adjustment:** Opening and closing speed of the parabolic plug can be easily controlled by adjustment on the distribution block using standard tooling.
- Size range DN50 - DN600.



SERIES 879 VARIANTS

One product, infinite variants



DESCRIPTION

AVK CONSTANT FLOW CONTROL VALVE PN10/16

AVK PRESSURE REDUCING CONTROL VALVE PN10/16

AVK PRESSURE RELIEF/ SUSTAINING CONTROL VALVE PN10/16

APPLICATION

For use with water.

For use with water.

For use with water.

MAIN FEATURES

- Stainless steel 316 internal and pilot components.
- Epoxy 300 microns coated internally and externally.
- Lifted seat design.
- Independent opening / closing speed control.
- High capacity filter.

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- Epoxy 300 microns coated internally and externally.
- Lifted seat design.
- Independent opening / closing speed control.
- High capacity filter.

MAIN OPTIONS

- Full bore and reduced bore options.
- Specific accurate spring ranges available as an option.
- 4 Orifice options for each valve size.
- Anti-cavitation trim.
- Multiple pilot options for additional settings.
- Solenoid override, fully opened/closed.
- Additional ball valves on upstream and downstream connections.
- Range of Y strainers.
- Full range of flange adaptors.
- V-port plug or Anti-cavitation trim.

- Full bore and reduced bore options.
- Specific accurate spring ranges available as an option.
- Pilot isolation option.
- Anti-cavitation trim.
- Low pressure PRV for ultra-low downstream pressure (0.1 – 1bar).
- 0.6–6bar, 5-10bar and 10-16bar spring ratings.
- Multiple pilot options.
- Solenoid override, fully opened/closed.
- Additional ball valves for upstream and downstream connections.
- Range of Y strainers.
- Full range of flange adaptors.
- V-port plug or Anti-cavitation trim.

- Full bore and reduced bore options.
- Specific accurate spring ranges available as an option.
- Anti-cavitation trim.
- 0.6 – 6Bar, 5-10Bar and 10-16Bar spring ratings.
- Multiple pilot options for additional settings.
- Solenoid override, fully opened/closed.
- Additional ball valves for upstream and downstream connections.
- Range of Y strainers.
- Full range of flange adaptors.
- V-port plug or Anti-cavitation trim.

SIZE

DN50-600.

DN50-600.

DN50-600.

MAX WORKING PRESSURE

16 Bar.

16 Bar.

16 Bar.

TEMPERATURE RANGE

-10°C to +70°C.

-10°C to +70°C.

-10°C to +70°C.

BODY MATERIAL

Ductile Iron
BS EN 1563 EN-GJS-500-7

Ductile Iron
BS EN 1563 EN-GJS-500-7

Ductile Iron
BS EN 1563 EN-GJS-500-7

APPLICABLE STANDARDS

BS EN 1074-5
BS EN 1092-2 (ISO 7005-2)
Reg 31 compliant
WIMES 8.09 compliant

BS EN 1074-5
BS EN 1092-2 (ISO 7005-2)
Reg 31 compliant
WIMES 8.09 compliant

BS EN 1074-5
BS EN 1092-2 (ISO 7005-2)
Reg 31 compliant
WIMES 8.09 compliant





AVK LEVEL CONTROL VALVE PN10/16

For use with water.

- Stainless steel 316 internal and pilot components.
- Epoxy 300 microns coated internally and externally.
- Lifted seat design.
- Independent opening / closing speed control.
- High capacity filter.



AVK BOOSTER PROTECTION/SURGE PREVENTION CONTROL VALVE PN10/16

For use with water.

- Stainless steel 316 internal and pilot components.
- Epoxy 300 microns coated internally and externally.
- Lifted seat design.
- Independent opening / closing speed control.
- High capacity filter.



AVK MULTI FUNCTION CONTROL VALVE PN10/16

For use with water.

- Stainless steel 316 internal and pilot components.
- Epoxy 300 microns coated internally and externally.
- Lifted seat design.
- Independent opening / closing speed control.
- High capacity filter.
- Hydraulic and/or electronic control.
- Combination of all pilot variants: Pressure; Flow and Level.
- Full solenoid control/overrides.
- Remote operation.



AVK DUAL SOLENOID DIGITAL CONTROL VALVE PN10/16

For use with water.

- Stainless steel 316 internal and pilot components.
- Epoxy 300 microns coated internally and externally.
- Lifted seat design.
- Independent opening / closing speed control.
- High capacity filter.
- Any pilot override to fully open/close.
- Remote operation.

- Full bore and reduced bore options.
- Specific accurate spring ranges available as an option.
- Modulating and non-modulating float options.
- Altitude pilot (no float necessary).
- Anti-cavitation trim.
- Multiple pilot options for Solenoid override for fully opened/closed.
- Additional ball valves for upstream and downstream connections.
- Range of Y strainers.
- Full range of flange adaptors.
- V-port plug or Anti-cavitation trim.

- Full bore and reduced bore options.
- Specific accurate spring ranges available as an option.
- Multiple pilot options for additional settings.
- Anti-cavitation trim.
- Solenoid override, fully opened/closed.
- Additional ball valves for upstream and downstream connections.
- Range of Y strainers.
- Full range of flange adaptors.
- V-port plug or Anti-cavitation trim.

- Full bore and reduced bore options.
- Specific accurate spring ranges available as an option.
- Multiple pilot options for additional settings.
- Anti-cavitation trim.
- Solenoid override, fully opened/closed.
- Additional ball valves for upstream and downstream connections.
- Range of Y strainers.
- Full range of flange adaptors.
- Normally open (NO) or Normally closed (NC) solenoid.
- 12 or 24 volt solenoid.
- Direct or non-direct current solenoid.
- Multi switch setting options.
- V-port plug or Anti-cavitation trim.

- Full bore and reduced bore options.
- Specific accurate spring ranges available as an option.
- Multiple pilot options for additional settings.
- Anti-cavitation trim.
- Solenoid override, fully opened/closed.
- Additional ball valves for upstream and downstream connections.
- Range of Y strainers.
- Full range of flange adaptors.
- Normally open (NO) or Normally closed (NC) solenoid.
- 12 or 24 volt solenoid.
- Direct or non-direct current solenoid.
- Fully open/close options.
- V-port plug or Anti-cavitation trim.

DN50-600.

DN50-600.

DN50-600.

DN50-600.

16 Bar.

16 Bar.

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16 Bar.

-10°C to +70°C.

-10°C to +70°C.

-10°C to +70°C.

-10°C to +70°C.

Ductile Iron
BS EN 1563 EN-GJS-500-7

BS EN 1074-5
BS EN 1092-2 (ISO 7005-2)
Reg 31 compliant
WIMES 8.09 compliant

BS EN 1074-5
BS EN 1092-2 (ISO 7005-2)
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BS EN 1074-5
BS EN 1092-2 (ISO 7005-2)
Reg 31 compliant
WIMES 8.09 compliant

PRODUCT SELECTION



879/000X-001

Pressure reducing valve

879/001X-001

Pressure sustaining / relief valve

910/21-001

Y-strainer

21/35

Flanged gate valve

21/78

Flanged gate valve prepared for actuator

701/50-003

Combination air valve, ductile iron

701/40-010

Combination air valve, reinforced polyamide

Select the right control valve

The following conditions should be taken into consideration in order to select the right solution for your application:

- Working conditions
- Maximum flow
- Minimum flow
- Continuous flow
- Maximum inlet pressure
- Minimum inlet pressure
- Required outlet pressure
- Pipe size

Strainers and isolating valves

It is highly recommended to install a protection strainer on the inlet side to filter out impurities that could damage the control valve. Isolating valves on each side of the control valve facilitate commissioning and maintenance.

AVK gate valves are available in a vast number of configurations. For isolating control valves, we recommend our standard flanged gate valve with short face-to-face length or the variant prepared for actuator.

Find more in-depth information about our gate valves, visit: www.avkuk.co.uk/en-gb/water-supply/control-valves/avk-control-valves

Air valves

In many cases it is recommended to install an air valve at the inlet of the control valve in order to avoid trapped air pockets in the system. Air pockets may cause increased energy consumption and operational costs, pressure loss and increased risk of water hammer.

AVK air valves are available in many variants. For control valve installations, we recommend our combination air valves of ductile iron or reinforced polyamide. Please refer to our datasheets found via our product finder at www.avkuk.co.uk

REDUCE OR SUSTAIN

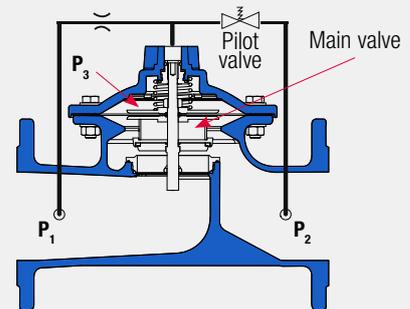
BASIC FUNCTION OF A CONTROL VALVE

P_1 : Inlet/upstream pressure P_2 : Outlet/downstream pressure P_3 : Control chamber pressure

Pressure reducing control valve:



Pressure sustaining/relief control valve:



Pressure reducing control valve

A pressure reducing control valve automatically reduces a higher inlet pressure to a lower outlet pressure regardless of changes in flow rate or inlet pressure.

The pressure reducing pilot senses the outlet pressure through the connection on the valve outlet port. Under flowing conditions, the pressure reducing pilot reacts to small changes in the outlet pressure, controlling the valve position by modulating the pressure in the control chamber. When the outlet pressure changes according to the set-value of the pilot, the pilot modulates to ensure pressure control.

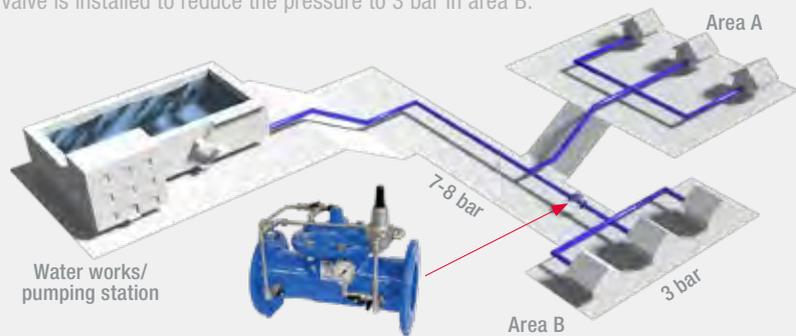
Pressure sustaining/relief control valve

A pressure sustaining control valve automatically maintains a minimum preset inlet pressure by relieving excess pressure, regardless of changes in flow rate.

The pressure sustaining pilot reacts to small changes in the inlet pressure, controlling the valve position. If the inlet pressure falls below the set point, the main valve closes or modulates to ensure a minimum inlet pressure. The sustaining valve holds a minimum back pressure on the inlet and normally allows flow. The relief valve normally remains closed and only opens when pressure exceeds a pre-determined set-point.

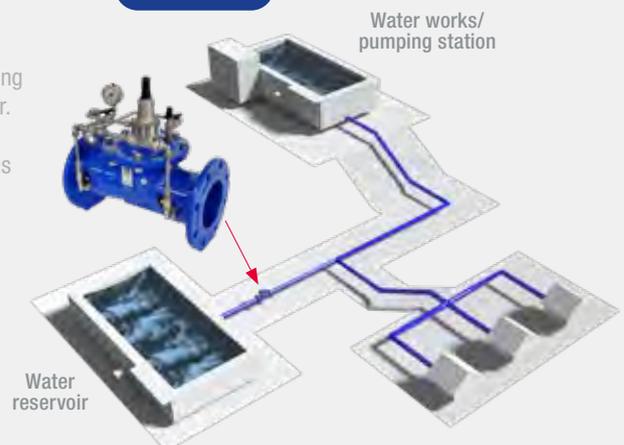
EXAMPLE 1

The pressure is 7-8 bar, which is appropriate to supply the consumers in area A but too high for the consumers in area B. Therefore, a pressure reducing control valve is installed to reduce the pressure to 3 bar in area B.



EXAMPLE 2

When the reservoir fills, the pressure drops, leaving consumers without water. Therefore, a pressure sustaining control valve is installed to maintain the pressure for consumers.



DIAPHRAGM OPERATED THE BENEFITS



The safe choice with 10-year warranty

AVK diaphragm operated control valves are designed according to EN1074-5 and provide network stability, accurate regulation, easy maintenance and long durability.

AVK control valves are available in DN50-600, with reduced and full bore. Control valves with reduced bore are appropriate for most applications, as the smaller bore often offers more accurate regulation. Control valves with full bore are recommended, if high Kv values are needed, e.g. in front of hydrants.

WRAS approved materials

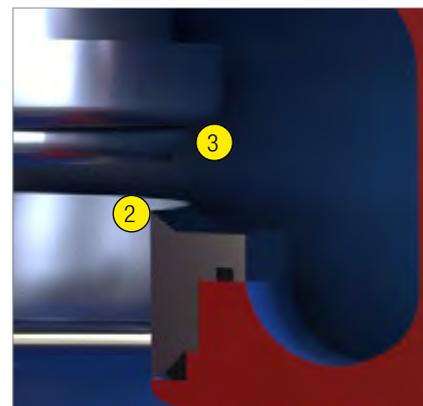
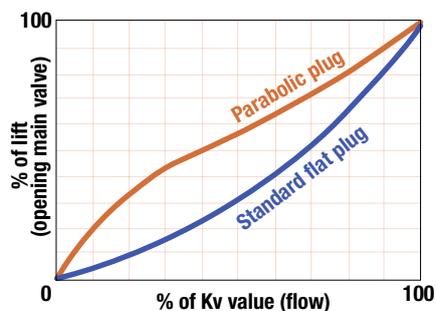
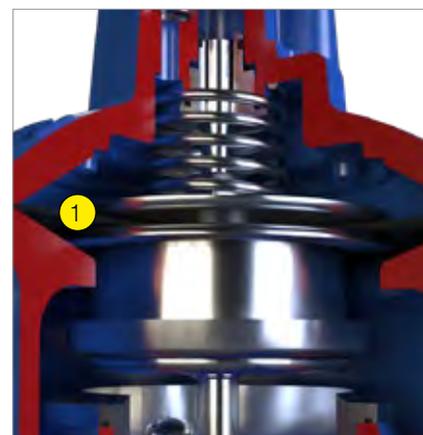
The body and bonnet are made of ductile iron with fusion bonded GSK approved epoxy coating.

The diaphragm is manufactured by AVK GUMMI and made of drinking water approved EPDM rubber with polyamide reinforcement.

All non-coated internals are of stainless steel AISI 316 as standard and all materials are WRAS approved.

Design feature

- Large diaphragm design (1) secures fast reaction to changes in pressure. Its asymmetric axial position gives less stress near closed position.
- Lifted seat design (2) prevents damage inside the valve body caused by cavitation.
- Parabolic plug design (3) provides precise regulation and stability at low flow. Furthermore, it reduces noise and vibration. See below characteristics, illustrating the performance compared to a standard flat plug design.



PRODUCT SPECIFICATION



Product description:

- Diaphragm control valve for water to max. 70°C.
- Full bore and reduced bore to suit a wider range of flow applications.
- Geometry of regulating disc provides high ratio of travel allowing optimal control performance.
- All non-coated internals made of AISI 316.
- External pipes and fittings AISI 316 as standard.
- Parabolic plug design.
- Large diaphragm: non-symmetric axial position of rubber diaphragm, giving less stretch/stress, near closed position.

Tests:

- Hydraulic testing according to EN1074-1 and 5, EN12266.
- Seat: 1.1 x PN (bar). body: 1.5 x PN (bar).
- Test of duty point (optional extra if specified).

Standards:

- Designed according to EN1074-5.
- Face to face according to EN558 table 2 basic series 1.
- Standard flange drilling to EN1092 (ISO 7005-2), PN10/16.
- Body and bonnet of ductile iron with fusion bonded epoxy to DIN 30677-2, GSK approved, RAL 5017, according to WRAS / DVGW/W270/UBA.
- WRAS approved materials.

Optional extras:

- Pressure gauges.
- Position indicator.
- Filter valve (back flushing).
- Anti-cavitation system.
- External pipes and fittings AISI 316.
- Different sfm's (single function modules) according to application.
- Different mfm's (multiple function modules) according to application.
- Lifting device (bow nuts BS 3974).

Installation:

It is highly recommended to install a protection filter as well as isolating valves to facilitate commissioning and maintenance. If necessary install an air vent at inlet of control valve.

SERIES 879 PILOT SYSTEM



Series 879 pilot system

The 879 design with interchangeable parts offers great flexibility as the pilot system is easily altered to fit other or multiple applications without replacing the valve. The pilot system consists of three main components:

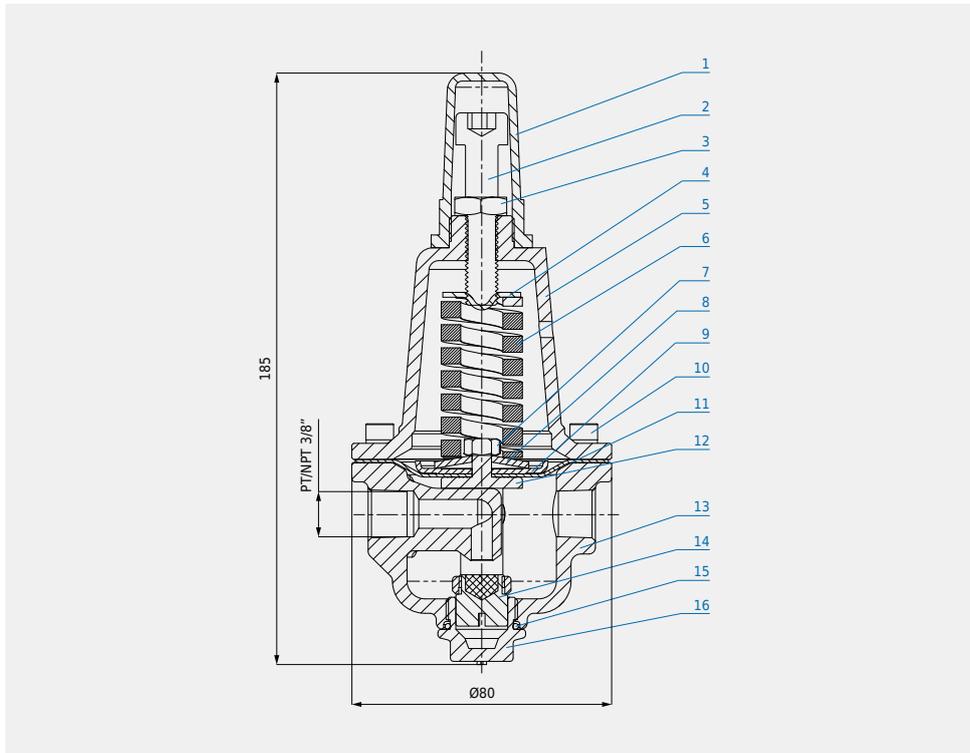
- The one way needle check valve offers independent opening and closing speed, easily adjusted using standard tooling, and giving full control e.g. in situations, where water hammer may occur.
- The filter features high capacity and easy maintenance. It offers easy access to cleaning, while the valve is in operation.
- The pilot can be set up for different applications. It features easy hand adjustment of the balanced pilot valve which is capable of very precise settings.

Compact design

The external pipework takes up less space and is less vulnerable to damage during installation compared to many other control valves.

It is designed using components with standard threads offering easy sourcing of replacements as well as easy fitting using standard tools. All metal parts are of stainless steel AISI 316 as standard.





Product		
Type Pilot	Range (bar)	Spring Colour
ACV100A	0.1-2.0	Yellow
ACV100B	0.5-3.5	Blue
ACV100C	1.0-5.0	Red
ACV100D	1.5-8.5	Green
ACV100E	1.5-10.0	Brown
ACV100F	2.0-15.0	Black
ACV100G	2.5-21.0	Black

Materials of Construction		
No.	Description	Material
1	Cap	Plastic
2	Adjusting Screw	Stainless Steel
3	Jam Nut	Stainless Steel
4	Spring Guide	Stainless Steel
5	Cover	Stainless Steel
6	Spring	Tempered Steel
7	Nut	Stainless Steel
8	Spring Guide	Mn-Steel+Ni Plated
9	Fixing Holder	Stainless Steel
10	Screw	Stainless Steel
11	Diaphragm	Nylon Reinforced
12	Obturator	Stainless Steel
13	Body	Stainless Steel
14	Disc	Stainless Steel + Rubber
15	O-Ring	Rubber
16	Plug	Stainless Steel

OPTIMISED OPERATION

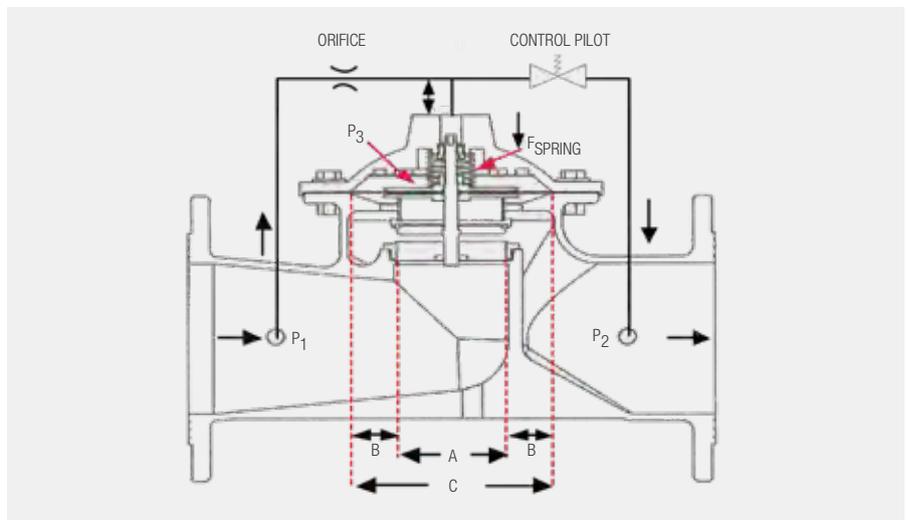


A restriction orifice, inside of the “strainer” located upstream of the control chamber, will limit the flow rate. A restriction orifice located just downstream of the filter will limit the flow rate. The valve will open if the flow rate allowed through the control pilot, located downstream of the control chamber, is greater than the flow rate allowed through the restriction orifice.

Taking “A” as the area of seat, the diaphragm area is approximately “C”. “P1” acts on area “A”. “B” is the diaphragm area that is exposed to “P2”.

The pilot controls the main valve by controlling the pressure.

No.	Description	Location	
1	Upstream Pressure “P1”	within area “A”	$P_1 \times A$
2	Downstream Pressure “P2”	within area “B”	$P_2 \times B$
3	Control Chamber Pressure “P3”	within area “C”	$P_3 \times C$
4	Spring Force		F_{Spring}
5	Opening Operation		$P_1 \times A + P_2 \times B > P_3 \times C + F_{\text{Spring}}$
6	Closing Operation		$P_1 \times A + P_2 \times B < P_3 \times C + F_{\text{Spring}}$
7	Modulating Operation		$P_1 \times A + P_2 \times B = P_3 \times C + F_{\text{Spring}}$
8	No Flow, No Pressure		$P_1 = P_2 = P_3$



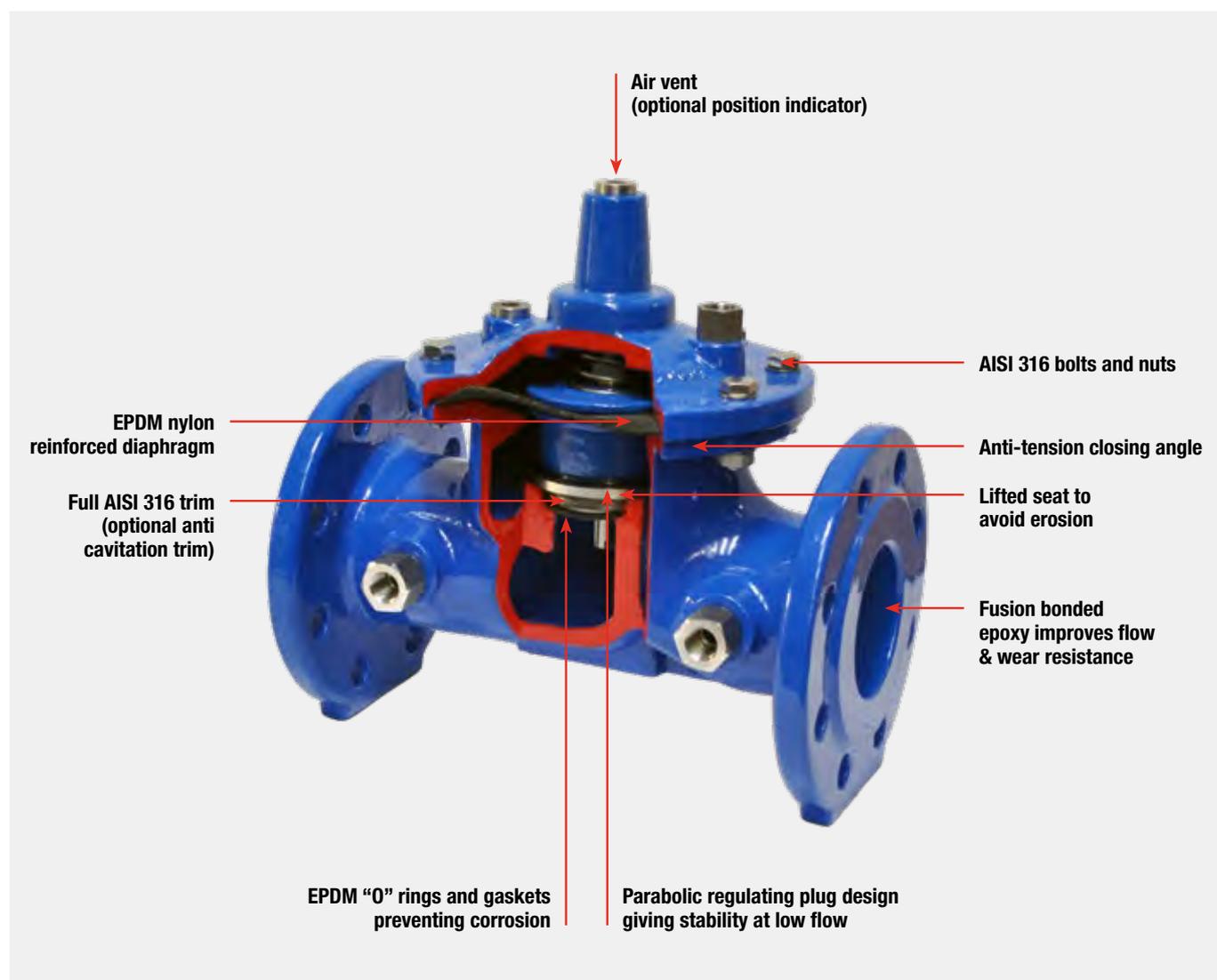
MAIN VALVE SERIES 879

Hydraulic operated, diaphragm-actuated globe valve.

The stem of the diaphragm assembly is fully guided into the seat, from top and bottom within the valve diaphragm assembly and is the only moving part. It forms a sealed chamber separating the operating pressure from the line pressure.

Components:

- Body
- Bonnet
- Diaphragm assembly



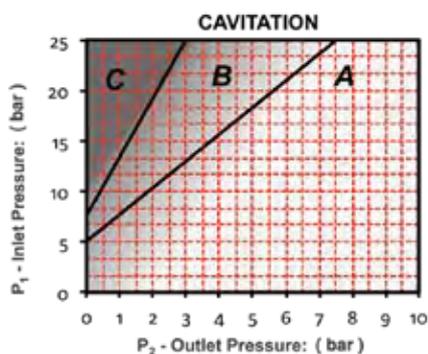
TECHNICAL DETAIL

Cavitation

Locate inlet and outlet pressure on cavitation chart. If point location falls in shaded area C or B, cavitation can occur. Continued use of standard valve in shaded area can cause deterioration in valve body and produce more noise and vibration.

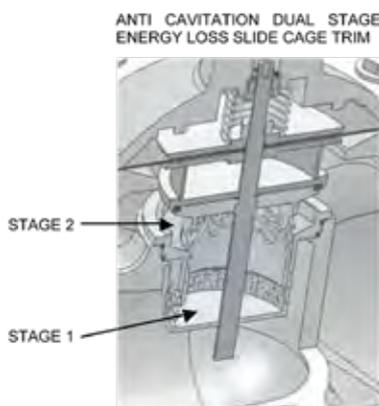
AREA A – Standard Valve
 AREA B – With Anti Cavitation System
 AREA C – Valves in Series

Consult AVK Technical Department for Special Applications - customerservice@avkuk.co.uk



Anti cavitation trim

To reduce the risk of cavitation the valve incorporates a double sliding cage design of AISI 316 construction. The seat slots are oriented around the plug cage. When the valve opens, flow converges in the centre of the first chamber of the seat cage, allowing the potential cavitation to dissipate. The upper slots of the internal sliding cage will divide the upstream flow before the regulating plug. The second chamber will dissipate energy before bubbles come in contact with internal surfaces of the main valve body and implode, thus preventing cavitation erosion. The seat and regulating plug design will guide the velocity vortices and steam bubbles to collapse out of body and avoids damage.



Valve performance, seat and regulating plug design

The parabolic design of the regulating plug ensures, at low flows, a smooth, precise and accurate regulation, reducing noise and vibration. In standard valves a lift of 10% represents a K_v value of 20%. With the new design a lift of 20% represents a K_v value of 10%.

Diaphragm closing angle

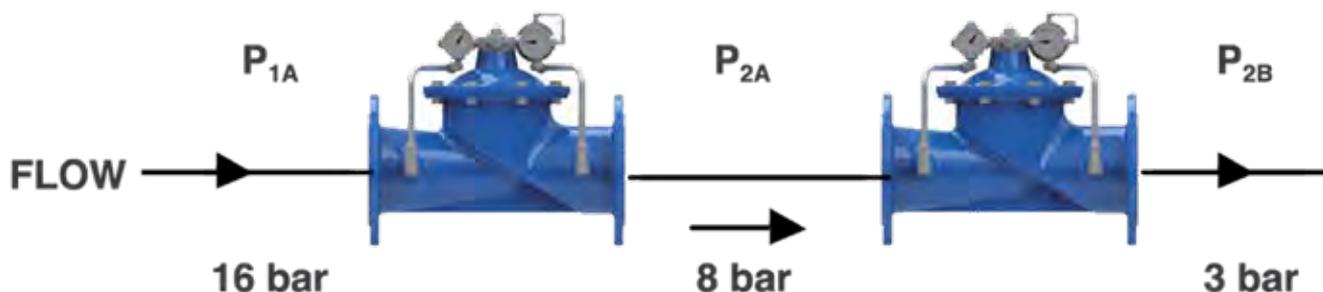
The plug design associated to the angle of diaphragm when the valve is closing, ensures seat chatter will not occur, causing no "stress" on diaphragm (tension). This means that the valve is designed for controlling precisely any flow rate from zero demand up to the maximum flow, without decreasing the valve performance.

Valve selection

- Check Working Conditions
- Maximum Flow
- Minimum Flow
- Continuous Flow
- Maximum Upstream Pressure
- Minimum Upstream Pressure
- Downstream Pressure
- Pipe Size
- Velocity
- Electrical Current

Installation valves in series

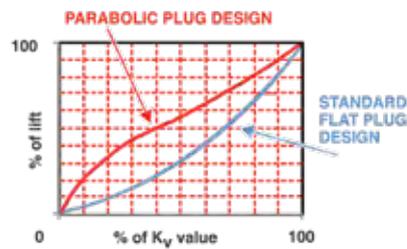
To prevent cavitation in high pressure drop application two valves in series can be used. Example: P₁: 16 BAR, P₂: 3 BAR





Spring ranges / Coil voltage

Pressure Reducing / Pressure Sustaining	SR1: 0.6 - 6 bar SR2: 5 - 10 bar SR3: 10 - 16 bar
Low Pressure Reducing	SR4: 0.1 - 1 bar
Solenoid Coils	24v DC, 24v AC, 230v AC



DO NOT OVERSIZE OR UNDERSIZE VALVE. USE THE FORMULAE.

MODEL	K _v VALUES									
	DN	50	65	80	100	125	150	200	250	300
1	44	76	116	175	NA	400	710	947	1355	
2	NA	53	83	119	135	202	435	734	990	

Key:
1 = FULL BORE
2 = REDUCED BORE

FORMULAE (ONLY FOR WATER)

K_v: Cubic meters of water, at 18° Celsius flowing through the open valve in one hour with a Δp of one bar.

$$Q = K_v \sqrt{\Delta p}, K_v = \frac{Q}{\sqrt{\Delta p}} \quad \Delta p = \left(\frac{Q}{K_v} \right)^2$$

HEAD LOSS

Use the formula:

$$\Delta p = \left(\frac{Q}{K_v} \right)^2$$

VELOCITY

Use the formula:

$$v = \left(\frac{354 \cdot Q}{DN^2} \right)$$

NOTE:

For intermittent high flow or low pressure application, please contact AVK - customerservice@avkuk.co.uk

EXAMPLE

Pressure Reducing Valve

P1: 8 bar, P2: 3 bar

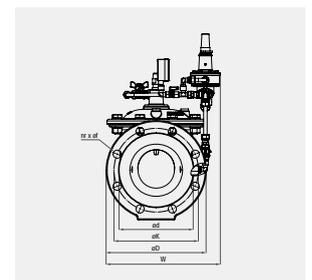
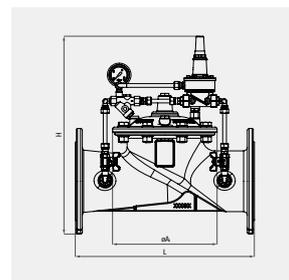
Flow: MAX – 130 m³/hr, MED – 40 m³/hr, MIN – 10 m³/hr

K_v = Q/√ΔP ΔP = 5 K_v = 130/2.24 K_v = 58

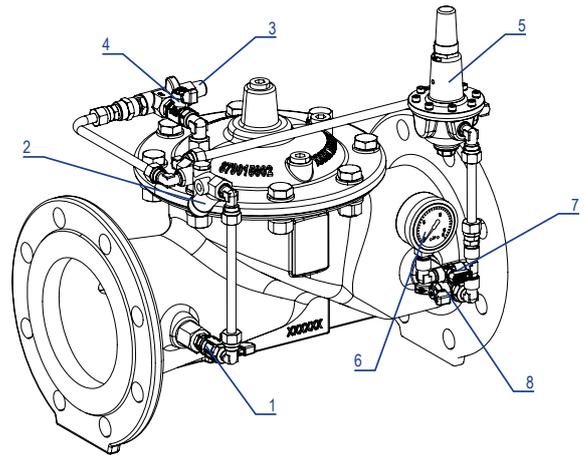
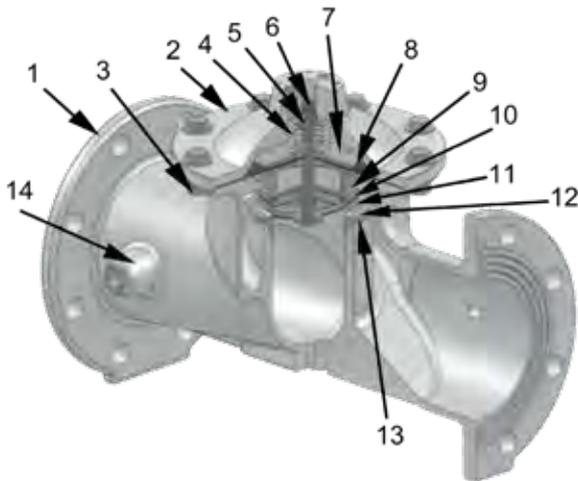
For proportional control valves use a safety 1.3 to avoid control failure in momentary high flows.

Safety factor 1.3 x 58 = 75

Valve DN 80 Reduced Bore



MATERIAL OF CONSTRUCTION



No.	Item	Material
1	Body	GJS-500/7
2	Cover	Ductile Iron, GJS-500/7
3	Bolts / Nuts	AISI 316
4	Spring	AISI 316
5	Stem Guide	AISI 316
6	Stem	AISI 316
7	Diaphragm Washer	AISI 316
8	Diaphragm	EPDM-WRAS/DVGW
9	Spacer	AISI 316
10	Disc Cage	AISI 316
11	1Disc	EPDM-WRAS/DVGW
12	Plug	AISI 316
13	Seat	AISI 316
14	"O" Rings Ductile Iron	EPDM-WRAS/DVGW

No.	Item	Material
1	2-Way Ball Valve	AISI 316
2	Strainer + Calibrated Orifice	AISI 316
3	Unidirectional Needle Valve	AISI 316
4	2-Way Ball Valve	AISI 316
5	Pressure Reducing Pilot	AISI 316
6	Pressure Gauge	N/A
7	2-Way Ball Valve	AISI 316
8	2-Way Ball Valve	AISI 316

SERIES 879 CONTROL VALVE SPECIFICATION

Size (DN)		AVK Ref No. (if known)	
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Operating Date

Q - Flow (m3/h)	Min:	Max:
P - Working Pressure (bar)	Min (P1):	Max (P2):
Pipe Size		
Fluid		
Temperature (°C)		

Construction

Bore	Full Bore	Reduced Bore
Pressure Class	PN10	PN16

Optional Extras

Position Indicator	Lifting Device (Bow Nuts BS 3974)	Position Indicator with Limit Switch
Anti-cavitation Trim	Outlet Pressure Gauge	Filter Back Flushing Valve
Inlet Pressure Gauge		

Other Requirements - Additional Options

Documentation (Standard, Special O&M's, Drawing, Test Certification)

NOTE

Please see the S879 Control Valve Interactive Selection Tool Page available on our website (www.avkuk.co.uk - click on the tech support tab and scroll down) for instant and accurate valve sizing and selection.

CONTROL VALVE VIDEOS

AVK's range of Control Valve videos includes maintenance, pilots changes, hints and tips, solenoid overrides and PRV controllers.

These informative videos are 3 minutes long or less and are presented by the AVK UK presented by David Hurley Smart Water Director.



Maintenance of the main valve of an AVK control valve
AVK Holding A/S
117 views



How to change an AVK pressure reducing valve to a pressure sustaining valve?
AVK Holding A/S
161 views

www.avkuk.co.uk - downloads - videos and animations

ASSOCIATED PRODUCTS

	<p>SERIES 01/79 AVK Resilient Seat Gate Valve with SupaPlus Socket Connections DN80-400 PN16 Ductile Iron BS EN 1074-1&2 BS 5163-2 EN 12842</p>		<p>SERIES 36/89 AVK PE Tailed Resilient Seat Gate Valve DN80-300 PN16 Ductile Iron BS EN 1074-1&2 BS 5163-2</p>		<p>SERIES 32/49 AVK Long Spigot End Gate Valve DN80-300 PN16 Ductile Iron BS EN 1074-1&2 BS 5163-2</p>
	<p>SERIES 21/35 AVK Resilient Seat Gate Valve DN80-200 PN10/16 upto DN150 PN16 only on DN200 Ductile Iron BS EN 1074-1&2 BS 5163-1&2 BS EN 1092 (ISO 7005-2)</p>		<p>SERIES 21/78 AVK Resilient Seat Gate Valve with ISO Flange DN50-400 PN10/16 Ductile Iron BS EN 1074-1&2 BS EN 1092 (ISO 7005-2) BS 5163-1</p>		<p>SERIES 764/01 AVK Eccentric Plug Valve DN80-300 PN16 Ductile Iron BS EN 1092-2 (ISO 7005-2) EN 558 SERIES 3 AWWA C517 NBR rubber 764/01-001 EPDM rubber 764/01-002</p>
	<p>SERIES 41/20 AVK Resilient Seat Swing Check Valve DN50-300 PN16 Ductile Iron BS EN 1074-3 BS EN 1092-2 (ISO 7005-2) EN 558-1 Series 48</p>		<p>SERIES 53/30 AVK Threaded Ball Check Valve DN32-50 PN10 Ductile Iron EN 12050-4 DIN 3202-F6</p>		<p>SERIES 702/50 AVK Knife Gate Valve with ISO Top DN50-1000 PN 10/16/25/40 Ductile Iron BS EN 1092-2 (ISO 7005-2) EN 558-1 Series 20</p>
	<p>SERIES 75/10 AVK Wafer Concentric Butterfly Valve, Vulcanised Liner DN50-1400 PN6/10/16 Various Materials BS EN 593 EN 558 Series 20</p>		<p>SERIES 76/70-002 AVK Wafer Butterfly Valve, Concentric with Loose Liner DN50-400 PN10/16 Ductile Iron BS EN 593 BS EN 1092-2 (ISO 7005-2)EN 558 Series 20</p>		<p>SERIES 756/100 AVK Double Eccentric Butterfly Valve with Rotork Gearbox and Handwheel DN200-2200 PN10/16/25 to DN1200 Ductile Iron BS EN 593 BS EN 1092-2 (ISO 7005-2)EN 558 Series 14</p>
	<p>SERIES 701/40 AVK Double Orifice Composite Material Air Release Valve ¾, 1, 2" inlet, PN16 Reinforced nylon BS EN 1074-4 For water use</p>		<p>SERIES 701/79 AVK Underground Air Release Valve System DN80 PN10/16 Reinforced Nylon BS EN 1074-4 For waste water use</p>		<p>SERIES 621 AVK Tensile Resistant Coupling DN40-300 PN16 Ductile Iron BS EN 12842</p>
	<p>SERIES 258 AVK Fabricated Coupling DN350-1600 PN16 Mild Steel</p>		<p>SERIES 601 AVK Universal Coupling DN40-400 PN16 Ductile Iron</p>		<p>SERIES 253/40 AVK Universal Supacollar Repair Clamp with Tapping Point DN80-300 PN16 Ductile Iron</p>

AVK ASSIST TAKE CONTROL OF YOUR CRITICAL ASSETS

Today, for many engineers, the mobile phone has become a key work tool. Recognising this, AVK has developed AVK Assist. An intelligent app that helps engineers specify and track key assets on their networks.

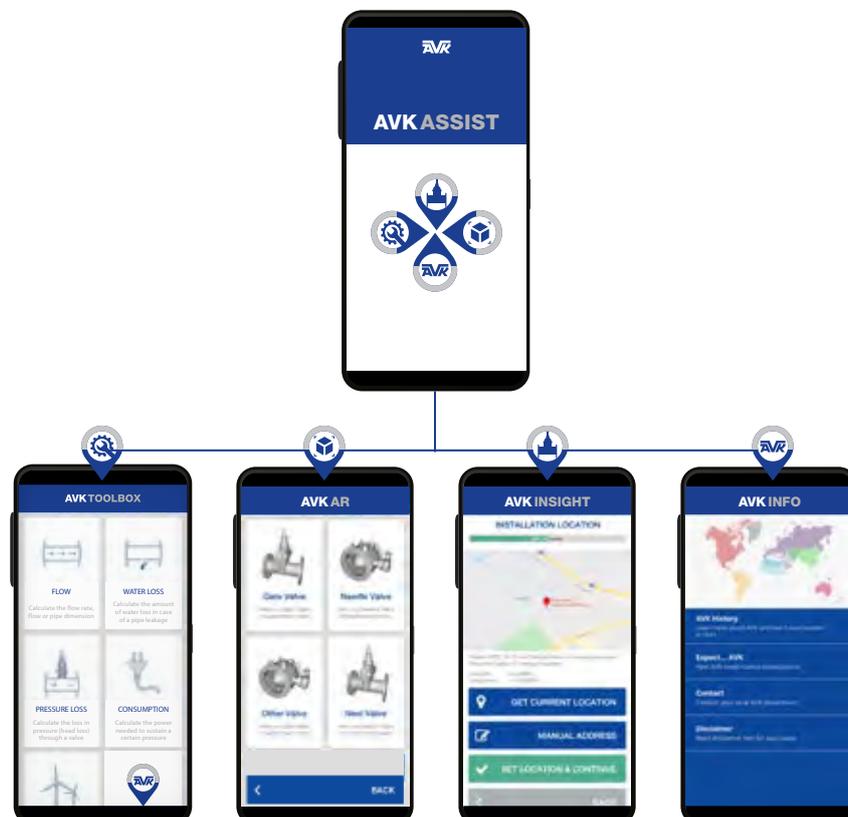
By building relationships with our partners, through listening and responding to both their key strategies and to their daily operational challenges, we are able to develop solution led products and services which help deliver and resolve issues.

Network management and asset mapping are two key subjects highlighted in the majority of utility strategies as an ongoing issue, the AVK ASSIST mobile app can make a major contribution on the journey to a resolution.

Aimed at utility and industrial, gas and water network engineers, the app is made up of four key elements: AVK Toolbox, AVK AR, AVK Insight & AVK Info, which will help specify, select, purchase and then record the installation quality and GPS location of the asset.

A comprehensive mobile-first, paperless solution for tracking all your assets. AVK Insight uses a QR code platform to enable full traceability of your assets. Each installed valve has a unique GPS pin location and, when combined with a photo of each installation, provides a complete, accurate and auditable record of every valve you install.

Installation data is confidential to the customer and can be exported in formats that allow integration with existing mapping systems.



EXPECT... OUR PROMISES TO YOU

“Expect... AVK” means that our customers should rightfully expect us to exceed market standards and become the preferred business partner among our industry.



- EXPECT... SOLUTIONS, NOT ONLY PRODUCTS
- EXPECT... GLOBAL LEADERSHIP AND LOCAL COMMITMENT
- EXPECT... QUALITY IN EVERY STEP
- EXPECT... PROMPT RESPONSE
- EXPECT... LASTING INNOVATIONS
- EXPECT... TOTAL SAVINGS
- EXPECT... A LONG-TERM PARTNERSHIP
- EXPECT... IT TO BE EFFECTIVE AND EASY

As a global leader, it is our obligation to keep pushing the boundaries of what the market can expect. In our business there are **five cornerstones** that must be in place in order to meet customer expectations:



QUALITY



INNOVATION



RELIABILITY



SUSTAINABILITY



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18-03-24
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Expect... 